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Original Research Article

Management of Tuberculosis Spine: Our Institute Experience

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Abstract

Background: Tuberculosis is a very common disease affecting the impoverished and is a source of morbidity causing significant burden to the society. Involvement of the spine is fairly common and it causes significant discomfort to the patient affecting their quality of life. Definite role of surgery continues to be debatable in the era of novel ATT drugs.

Objective: To define the role of surgery in TB spine and to assess outcome in terms of symptom relief.

Methods: Forty patients with TB Spine who were admitted in our department were retrospectively evaluated thoroughly and the outcome of both conservative treatment and surgical management was analyzed.

Results: Dorsolumbar TB was the commonest site of involvement and among those cases, 3 patients had demonstrable pulmonary lesions. Surgery gave good neurological outcome in cases that presented with deficits and for cases that didn't respond to ATT.

Conclusions: Surgery continues to be a mainstay in treatment of TB spine and we had successful outcome in our observation.

Keywords: Pott's Spine; TB Spine; Posterior Stabilization for TB Spine; Spinal Fusion for TB Spine; Management of TB Spine.

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Introduction

Tuberculosis is one of the oldest scourges of mankind with evidence showing the presence of TB infestation even in mummies from the 3000 BC [1]. Over the years, there has been a dramatic improvement in the modalities available for early diagnosis as well as treatment of tuberculosis [2, 3]. Spine involvement is among the most common extra pulmonary manifestation of TB and is the cause of severe morbidity. Tuberculosis and its various forms are still very rampant in India. Tuberculosis of spine is the most common and the most serious form of skeletal tuberculosis [4]. The thoracic spine is the most common site of affection. Tuberculosis usually affects the intervertebral disc and the adjacent vertebral bodies, the "paradiscal" area. Involvement of the posterior elements is very uncommon.

The disease is known as Pott's spine. The name traces back its origin from the description of tuberculous infection of the spine by Sir Percival Pott in his monograph in 1779. The majority of his patients were infants and young children. The classic destruction of the disc space and the adjacent vertebral bodies, destruction of other spinal elements, severe and progressive kyphosis subsequently became known as Pott's disease.

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Currently, the term 'Pott's disease/Pott's spine' describes tuberculous infection of the spine and the term 'Pott's paraplegia' describes paraplegia resulting from tuberculosis of the spine [5]. Although multidrug-resistant tuberculosis is not common in spinal disease, there have been a few recent case reports [6].

With the availability of several second line drugs, medical management continues to be the mainstay with regards to treatment of TB Spine with surgery being reserved for those who didn't respond to medical management and those with neurological deficit. In developing nations like India, patients tend to present at a later date with advanced signs and symptoms and often with neurological deficits making the role of surgery far more pronounced. We retrospectively analysed our institute experiences in treatment of patients with spinal TB.

Materials and Methods

Our's is a retrospective study that included 40 patients with spinal tuberculosis who were admitted in our institute in the last 5 years with symptoms of severe pain, deformity, weakness or sensory deficit with involvement of cervical (5 cases), thoracic (25 cases) and lumbo-sacral (10 cases) pathology. Imaging in the form of pre-operative X rays, CT and MRI were taken after a thorough clinical examination including an elaborate history. Pre-operative chest X ray, mantoux, ESR, Sputum for AFB were done and opinion was sought from Thoracic physician and as per their advice, the patients were placed on ATT regimen (AKT 4) and steroids as per patient's disease severity. Patients were offered the appropriate surgical treatment option when required.

TB Cervical spine was operated through an anterior approach and corpectomy/discectomy with titanium cylindrical mesh cage with bone graft and anterior cervical plating was also done. Thoracic spine diseases were treated by posterior approach, decompressive laminectomy either alone (4 cases) or with pedicle screws and rod fixation with or without interconnecting rods and also through postero-lateral thoracotomy (2 cases) with debridement of diseased vertebrae, drainage of abscess and placement of cylindrical titanium mesh cage with bone graft and vertebral body screws for levels above and below the diseased segment. TB Lumbosacral vertebrae were treated with a posterior approach, decompressive laminectomy and pedicle screws with rod fixation with or without interconnecting rods. All procedures were performed under image guidance.

The excised bone, granulation tissue, evacuated pus were all sent for AFB staining and HPE. All patients were administered Methyl Prednisolone or Dexamethasone in the immediate postoperative period and subsequently tapered to oral steroids. Oral steroids were administered for initial 4 weeks.

All the patients were made to sit from the 2nd post-operative day and were mobilised early. Even in patients with paraplegia and paraparesis, mobilisation with wheel chair was done and aggressive physiotherapy was carried out. Both active and passive physiotherapy to limbs and chest were provided. Patients were placed on either alpha or water beds. None of the patients developed pressure sores during their hospital stay. One patient with TB Dorsal spine was admitted with Grade 1 pressure sore in the gluteal region and was managed with serial dressing and appropriate medications and the wound healed well. Symptomatic relief and outcomes were assessed.

Results

In our study, 16 patients were below 40 years and 9 were above 60 years. The remaining 15 patients belonged to the 40 to 60 age group. All patients belonged to the middle and lower economic group. None of the patients had HIV infection. 5 patients had proven prior Pulmonary Tuberculosis and were treated earlier.

Of the 37 operated patients 24 had dorsolumbar involvement, 8 patients had lumbosacral involvement and 5 patients had cervical spine involvement. Of the conservatively managed cases, 2 had lumbosacral and one had dorsolumbar involvement.

Successful outcome was defined as improvement of power by one grade or subjective improvement as perceived by the patient. All patients who underwent surgical intervention had significant symptomatic improvement.

All the patients who were operated showed symptomatic improvement and pain relief was observed. All the three remaining conservatively managed cases responded well to ATT medications which were administered for more than 1 year.

Fig. 1: Pre-operative MRI and Post-operative X Ray of TB Cervical Spine.

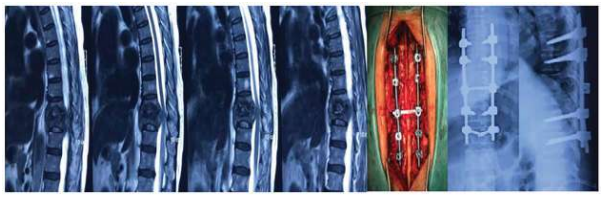

Fig. 2: Dorsal spinal Tuberculosis- Pre operative, intra operative and post-operative images.

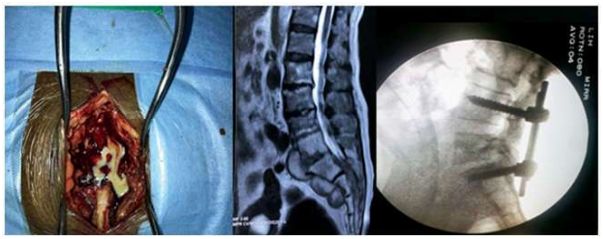

Fig. 3: TB involvement of LS Spine- Intra operative, pre and post-operative images.

Discussion

Spinal TB spreads hematogenously from either an infected node or a pulmonary lesion. The densely vascular cancellous bones and the Batson's venous plexus offer paths of spread with minimal resistance. The initial site of infection is the anterior and inferior part of the body from where disc involvement leads to the hallmark discitis associated with TB spine. Predisposing factors include extremes of age, poverty, alcoholism, confinement, overcrowding, malnutrition and immune compromised state [7,8,9,10,11,12]. This dynamic gains significance in the era of a HIV pandemic.

Neurological deficit can result due to a variety of factors. Mechanical compression from the debris, TB granuloma, TB myelitis, arachnoidits and thrombosis of spinal arteries can all cause neurological deficit. Delayed deficit can present due to pachymeningitis and transection of cord by distorted bony elements. The spread of the disease is insidious and the average duration ranges from 4 to 11 months. While constitutional symptoms are present in 20 to 30 %, pain is the commonest symptom [13,14]. In our observation, local and radicular pains were the commonest symptoms, present in all the patients with local tenderness noted on examination.

Hodgson and Stock were the first to advocate surgery for TB Spine, but this view was opposed by Konstam and colleagues [15,16,17]. Surgery offered was either debridement alone or in combination with stabilisation. A Cochrane's review showed limited benefits in routine use of surgery but better outcome in terms of pain relief, less kyphosis, early fusion and earlier return to normal function [18]. A study in Korea involving 116 patients, surgery was found to have a favourable outcome through logistic analysis although 82 patients were conservatively managed.

In our study of 40 patients, 3 patients were conservatively managed. They presented with radicular and local pain with sensations intact and without motor weakness. These patients were treated with 6 months of AKT 4 followed by 1 year of 2 drugs ATT regimen. These patients had both clinical and radiological improvement. Among those 3 patients, 2 patients had involvement of LS spine and the other patient had TB of Dorsal Spine. All patients were treated with analgesics and restricted movement for the initial 6-8 weeks followed by physiotherapy and limb strengthening exercises.

In the 80s, the surgeons opted for a middle path regimen of Tuli which advocated surgery for those who did not respond to ATT [19]. The dilemma regarding surgical intervention stemmed from the fact that many patients showed recovery with use of ATT. But, offering surgery for a patient with neurological deficit with no sufficient evidence supporting the benefits of decompression can present a serious clinical dilemma. However, the recent use of MRI has enabled differentiating between liquid pus causing compression and harder bony and soft tissue elements causing compression. This can aid the surgeon in arriving at a decision [20].

Cervical TB is relatively rare and with the use of ATT, the role of surgery is limited but may be significant in carefully selected patients. Hasan et al reported that surgery resulted in improvement of symptoms in 18 patients that underwent anterior

stabilisation. 12 patients had complete recovery and all patients were relieved of pain [21].

In our series 5 patients had cervical spine involvement, 4 of whom had a single level and one had two level disease. Pain was the commonest presenting symptom while 2 patients had quadriparesis with bowel and bladder involvement. All the patients underwent anterior approach, corpectomy with titanium cage with bone graft and anterior cervical plating. Though the limb weakness took minimum of one month to recover, all patients had improvement of pain.

Dorsal and lumbar TB, while common, has had wild fluctuations in consensus regarding management. While proponents of both aggressive surgical debridement and complete conservative care exist, a middle path is often considered safe and beneficial for the patients. In general, any patient who fails conservative therapy for a period of about 6 weeks and those who develop complications during therapy and those with deficits attributable to compression are candidates for surgery [22].

In our study, of the 37 operated patients, dorsal spine accounted for 24 cases. Pain was the most predominant symptom present in all the patients. Constitutional symptoms like fever were present in 6 cases. Bladder and bowel involvement was seen in 2 cases. Among these 24 patients, 10 patients had multilevel involvement. 2 patients were operated with posterolateral approach. 4 patients underwent simple decompressive laminectomy of the affected spine. In 18 patients decompression with posterior stabilisation with pedicle screw and rod fixation was done. 14 patients had kyphosis and in these cases posterior stabilisation was done in 2 levels above and 2 levels below. Given the change of surgical approach from the Posterolateral to the posterior approach, our intervention was predominantly posterior in the last 5 years.

LS spine involvement was seen in 8 cases of which 6 had single level involvement and 2 had two level involvement. All the patients had local and radicular pain. 4 patients had weakness of lower limb and bladder and bowel symptoms. Patients underwent posterior stabilisation with pedicle screws and rods with interconnecting rod was also used when stabilisation involved 2 levels.

Conclusion

Even in the era of novel anti tubercular medications, surgery plays a significant role in the management of extra pulmonary tuberculosis especially in TB Spine. TB Spine with neurological deficit poses a significant challenge and the mainstay of a successful treatment is early diagnosis, detailed investigations and early initiation of ATT and prompt surgical intervention when indicated as in unresponsiveness to therapy or presence of neurological deficits or deformity. Early surgery followed by ATT was an effective treatment modality as we found in our observation. Successful treatment depends on regular follow up, drug compliance and physiotherapy. Imparting knowledge to the general public and sensitising the clinicians regarding the nature of the disease and clinical evaluation will prevent cases presenting in the late stage and with intractable symptoms while aiding in waging a successful battle against TB spine.

References

1. Taylor GM, Murphy E, Hopkins R, Rutland P, Chistov Y. First report of Mycobacterium bovis DNA in human remains from the Iron Age. Microbiology. 2007;153(4):1243–9
2. Jain AK. Tuberculosis of the spine: a fresh look at an old disease. J Bone Joint Surg Br. 2010;92(7):905–13
3. Jain AK, Dhammi IK. Tuberculosis of the spine: a review. Clin Orthop Relat Res. 2007;460(July):39–49
4. Gautam MP, Karki P, Rijal S, Singh R. Pott's spine and Pott's paraplegia. J Nep Med Assoc. 2005;44(159):106–15
5. World Health Organization. HIV/TB Facts 2011 [assessed on 2011 Jun 11]. http://www.who.int/hiv/topics/tb/hiv_tb_factsheet_june_2011.pdf .
6. World Health Organization. 2010/2011 tuberculosis global facts. Facts sheet no 104, 2010 Nov [accessed on 2011 Apr 16]. Available at: http://www.who.int/mediacentre/factsheets/fs104/en/
7. Dobson J. Percivall Pott. Ann R Coll Surg Eng. 1972;50(1):54–65. [PMC free article]
8. Pawar UM, Kundnani V, Agashe V, Nene A, Nene A. Multidrug-resistant tuberculosis of the spine – is it the beginning of the end? A study of twenty-five culture proven multidrug-resistant tuberculosis spine patients. Spine (Phila Pa 1976). 2009;34(22):E806–10
9. Tuli SM. Tuberculosis of the shoulder. Tuberculosis of the skeletal system. 1st ed New Delhi: JayPee Brothers Medical Publisher (P) Ltd; 1993.
10. Boachie-Adjei O, Squillante RG. Tuberculosis of the spine. Orthop Clin North Am 1996;27(1):95–103.
11. McLain RF, Isada C. Spinal tuberculosis deserves a place on the radar screen. Cleve Clin J Med. 2004;71(7):543–9
12. Garg RK, Somvanshi DS. Spinal tuberculosis: a

review. J Spinal Cord Med. 2011;34(5):440-54.

13. Yilmaz MH, Mete B, Kantarci F, Ozaras R, Ozer H, Mert A, et al. Tuberculous, brucellar and pyogenic spondylitis: comparison of magnetic resonance imaging findings and assessment of its value. South Med J. 2007;100(6):613–4
14. Hodgson AR, Stock FE, Fang HS, Ong GB. Anterior spinal fusion. The operative approach and pathological findings in 412 patients with Pott's disease of the spine. Br J Surg. 1960;48(September):172–8
15. Konstam PG, Konstam ST. Spinal tuberculosis in Southern Nigeria with special reference to ambulant treatment of thoracolumbar disease. J Bone Joint Surg Br. 1958;40-B(1):26–32
16. Konstam PG, Blesovsky A. The ambulant treatment of spinal tuberculosis. Br J Surg. 1962;50(July):26–38
17. Jutte PC, Van Loenhout-Rooyackers JH. Routine surgery in addition to chemotherapy for treating spinal tuberculosis. Cochrane Database Syst Rev. 2006;(1):CD004532. DOI: 10.1002/14651858. CD004532
18. Tuli SM. Results of treatment of spinal tuberculosis by 'middle path' regime. J Bone Joint Surg Br. 1975;57(1):13–23
19. Twelfth report of the Medical Research Council Working Party on Tuberculosis of the Spine Controlled trial of short-course regimens of chemotherapy in the ambulatory treatment of spinal tuberculosis: results at three years of a study in Korea. J Bone Joint Surg Br. 1993;75(2):240–8
20. Surgery for spinal tuberculosis: a multi-center experience. Md. Shah Alam, Kevin Phan, Rezaul Karim, Sharif Ahmed Jonayed, Hasan Khalid Md. Munir, Shubhendu Chakraborty, Tashfique AlamJ Spine Surg. 2015 Dec;1(1):65–7.
21. World Health Organization. Treatment of tuberculosis: guidelines. 4th ed. (WHO/HTM/ TB/2009.420) World Health Organization; 2010 [assessed on 20].